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Arctic Hydrocarbon Exploration & Production: Evaluating the Legal Regime for Offshore Accidental Pollution Liability

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The Arctic has enormous hydrocarbon potential which is attracting international oil companies to invest, explore and exploit its reserves. Drilling in this region presents infrastructural, technological and environmental challenges with high accidental pollution risks involved. In the wake of the Deepwater Horizon incident of 2010 in the Gulf of Mexico, there are serious concerns about the effects and legal consequences of a possible major oil spill. This calls into question the adequacy of existing global and regional regulatory frameworks governing accidental pollution, particularly in such important area as oil pollution damage liability and compensation. It is important that an international regime is in place that provides prompt and adequate compensation to the victims of pollution and remedial measures necessary to protect the Arctic environment and innocent third parties. This paper examines and evaluates global and regional regulations pertinent to pollution resulting from offshore petroleum operations in the Arctic, focusing especially on accident pollution liability and compensation from offshore facilities. A regional intergovernmental framework or an industry-wide compensation scheme would be among the most obvious options in addressing the apparent gap in the existing environmental regime of the Arctic.

Introduction

Geographically, the Arctic is defined as the region situated north of the Arctic Circle (U.S Energy Information Administration, 2012). A simple definition is that it is approximately 66 degrees North parallel, enclosing parts of Alaska (USA), Canada, Greenland (Denmark), Iceland, Sweden, Norway, Finland, and Russia (Johnstone, 2015). The economic and hydrocarbon potential of the Arctic region is gradually attracting global interest (Kaiser, Fernandez & Vestergaard, 2016). Viewed as the final frontier for conventional hydrocarbon development, it is likely to become the most promising area for international oil companies (IOCs) in the near future.

The Arctic is portrayed as one of the few unspoiled ecosystems with limited human interaction, although offshore exploration began in the 1970s, with about 10,000 wells drilled to date (Sahu, 2016). It is mostly occupied by Indigenous peoples and has unique environmental characteristics

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which can be affected by large-scale economic activities (Newman, Biddulph & Binnion, 2014; Scarpa, 2014). There are over four million people including thirty Indigenous groups living in the region (Stouwe, 2017).

An oil spill could damage all aspects of the ecosystem (Gordeeva, 2013). As the Arctic ice cover is gradually decreasing due to climate change, the prospects for hydrocarbon exploration and production (E&P) in places that were inaccessible before are increasing (Osofsky, Shadian & Fechtelkotter, 2016; Ebinger, et al., 2014). The Arctic has valuable marine living resources which could be affected by large scale E&P activities. Presently, there exists no confirmed technology that could remove oil pollution from under the ice, although some areas where petroleum production will be taking place are already ice free. The main environmental concern is about the impact of possible oil spills on Arctic waters and the transboundary dimension this could assume, calling into question the effectiveness of the existing emergency preparedness and response measures in the Arctic, as well as the adequacy of the liability and compensation regime for offshore pollution damage arising from hydrocarbon E&P. These concerns are informed by the Macondo incident in the Gulf of Mexico and the damage it caused to local fishermen, businesses and tourism. The Macondo oil spill impacted the shorelines of about five littoral states in the U.S. and was capped after 87 days (The Guardian, 2010).

With offshore drilling operations significantly benefiting the Arctic countries' economies, it is imperative that an international or an Arctic-specific regime is in place to address accidental pollution liability and emergency response, to adequately protect the Arctic environment and innocent third parties. Although non-binding vessel-focused pollution prevention measures have been developed within the Arctic Council, a rather soft regional institutional mechanism (Sahu, 2016), no Arctic-wide offshore liability regime exists today to address accidental pollution arising from hydrocarbon E&P. The aim of this paper is to examine and evaluate global and regional regulations pertinent to pollution resulting from offshore petroleum operations, focusing especially on liability for accidental pollution damage. This paper suggests that an industry-wide compensation scheme or a binding regional instrument would be two most likely options in establishing an accidental pollution liability regime for the Arctic Ocean.

Hydrocarbon Potential of the Arctic

Global interests in developing Arctic hydrocarbon resources have been growing fast. This attention has been influenced largely by the demand for energy and significant potential oil and gas resources of this frontier region (Kaiser et al., 2016). It is estimated that the entire Arctic holds more than 87% of the earth's oil and natural gas reserves (Murray, 2018). These estimates were based on a probabilistic methodology of geologic analysis and analogue modelling; they are however not final (Bishop, Bremner, Laake, Parno & Utskot, 2011). The US Geological Survey, in 2008, assessed the oil and gas potential of the North Arctic Circle and indicated that it holds about 90 billion barrels of oil and 1,669 trillion cubic feet of natural gas, and a possible 44 billion barrels of undiscovered natural gas liquids, with 84% of these located offshore (USGS, 2008). These estimated figures represent 13% of the world's undiscovered oil resources and 30% of world's undiscovered natural gas resources (Ebinger, Banks & Schackman, 2014).

Similar estimates from Russia support assessment of the significant petroleum potential of the Arctic (Schofield & Potts, 2008; Baev, 2007). Russian scientists used the regression relationship

method to calculate the probabilistic estimate of oil and gas resources of the Eurasia sedimentary basin in the Arctic Ocean (Kontorovich et al., 2010). The findings show that in the second half of the century, the Arctic petroleum super basin could provide the required energy resources that are comparable to those of the West Siberian petroleum basin or the Persian Gulf (Kontorovich et al., 2010). The bulk of the estimated oil and gas can only be retrieved through complex offshore drilling techniques; about 80% of the Arctic energy resources are situated in the areas covered by ice for most of the year (Osofsky et al., 2016). More than 15 oil and gas fields have been discovered in the Kara, Pechora, and Barents Seas of the Russian Arctic region (Bishop et al., 2010).

Recent oil discoveries in the Nanushuk and Torok formations announced during 2015-2017 in the US, indicate that the North Alaska Slope holds significant reserves (USGS, 2017). In 2011, the Prudhoe Bay field in Alaska's North Slope was estimated to hold about 2.1 billion m^3 of recoverable oil, out of the 4.0 billion m^3 estimated. It also has a projected 736 billion m^3 of recoverable natural gas, out of 1.3 trillion m^3 estimated (Bishop et al., 2011). The Drake gas field in the Canadian Arctic has been evaluated to hold 153 billion m^3 of gas, while about 453,160 m^3 of oil was extracted from the Bent Horn field on Cameron Island from 1985-1996 (Bishop et al., 2011). The Norwegian Snohvit field is also estimated to hold significant recoverable reserves.

The territories controlled by the five coastal states of the Arctic Ocean - Canada, US, Norway, Russia, and Greenland (Denmark) - hold more than three-quarters of the Arctic resources (Henderson & Leo, 2014). As ice covered areas diminish due to the increase of global temperatures, these resources are becoming more accessible, opening new opportunities for hydrocarbon development and transportation to world markets, through the Northern Sea routes (ibid). Recent innovations in extraction technologies and ship design enable access to the Arctic resources, thereby increasing energy security in the twenty-first century (Stouwe, 2017). The resource potential of the region has led to the Arctic being branded as the "*new energy province*" (Østhagen, 2013).

Existing and Prospective E&P Activities in the Arctic

Energy companies have made high-profile forays into the Arctic to develop its oil and gas resources. Prior to this recent interest, there had been several rather earlier attempts to develop hydrocarbons in the Arctic. In 1968, Standard Oil and ARCO drilled a well that tapped the largest oil field in Prudhoe Bay on the North Slope of Alaska. Production started in 1977 after the trans-Alaska Pipeline System from Prudhoe Bay to Valdez was completed (Tippee, 2015). As time went on, Shell also discovered oil in the Arctic in 1980, and in 2012, BP found oil at its Liberty field in the Beaufort Sea; but high production costs had led to the abandonment of these discoveries.

In the Far North and the Arctic Norwegian and Russian waters, Gazprom, Statoil and Rosneft carried out E&P activities over several years (Wilson Center, 2014). In the Barents Sea, about 130 wells have been drilled to date with mixed results (Murray, 2018). At the Goliath field in the Barents Sea, Eni Norge AS has been producing for about a year. In January 2017 Statoil discovered oil and gas in the Cape Vulture well, followed by two additional finds in July (Murray, 2018).

In the Russian waters of the Arctic, Gazprom is progressing in the Pechora Sea (Stouwe, 2017). In 2014, the Rosneft-ExxonMobil venture successfully completed the drilling of the northernmost well in the world - the Universitetskaya-1 well in the Kara Sea oil province (Rosneft, 2014). As of January 2017, Rosneft owns 55 licenses in the offshore areas of the Arctic (Rosneft, 2018).

In the Nikaitchuq field offshore the North Slope of Alaska, Eni has attained its production goal of 25,000 barrel per day. In a water depth of 3 metres, the field holds reserves estimated at 200 MMboe (Offshore Energy, 2014).

Exploratory drilling in the Canadian Arctic could be traced to the Canadian Beaufort in 1972. Although activity in the region slowed down in the 1980s, renewed exploratory efforts resumed in the early 2000s. It is Canada's largest offshore oil project and remains an important test case along the Arctic learning curve. Hibernia in the Canadian sub-Arctic waters is one of the biggest resource development projects (Stouwe, 2017).

In Greenland, the first substantial offshore seismic surveys were carried out and experimental wells drilled in West Greenland in the 1970s, and another exploratory well drilled in 2011, albeit, with little success. Despite this, Tullow Oil accepted to buy a 40% stake in an exploration block in the Baffin Bay.

These discoveries have shown that hydrocarbon development in the fragile Arctic environment is gaining pace (Wilson Center, 2014). Experts forecast that by 2030, geological exploration will mainly be carried out on the Arctic shelf, and petroleum deposits in the area will be prepared for further, large-scale development (RIAC, 2015). The exploratory efforts have raised global awareness and concerns about the Arctic environment in the event of a significant oil spill. While IOCs continue to invest in and ramp up exploration, development, and production operations across this frontier region, serious regulatory, environmental, and technological challenges that face hydrocarbon operations must be properly addressed (Tippee, 2015).

Offshore Operations and their Possible Effects

Offshore E&P activities are risky. They involve the extraction of hydrocarbons, require the use of potentially harmful substances and produce various emissions and discharges (E&P Forum & UNEP, 1997). Accidental pollution caused by gas blowouts, oil spills and chemical spills during offshore petroleum development could result in possible or actual harm to the environment, in the form of physical, chemical, and biological disturbances in the water column, on the seabed, and in the atmosphere (Vinogradov, 2013). The Arctic is particularly fragile in this respect, being home to Indigenous populationS and important marine resources, and is characterised by special environmental vulnerabilities. It is exposed to possible impacts from various marine activities (Arctic Council, 2009) such as accidental releases of oil during petroleum extraction and transportation. E&P may cause oil pollution, which is considered one of the six priority environmental problems threatening the Arctic. Others are radioactivity, persistent organic contaminants, noise, heavy metals, and acidification (Koivurova, Kankaanpaa & Stepien, 2015).

The melting of the ice cover has improved access to mineral resource development (Schofield & Potts, 2008) and heightened IOCs interests to explore and exploit this resource-rich region (Stouwe, 2017). An assessment of hydrocarbon activities by the Arctic Council shows that at present the extent of oil pollution in the Arctic is low and is mostly related to natural seepage. However, it was noted that an accidental oil pollution is the largest threat to the marine environment (Arctic Council, 2009). In the event of an oil spill, the response time is substantially slower, as containment crew must wait for temperate seasons to assess damage. Although chemical dispersants could reduce the extent of an oil spill (Lewis & Prince, 2018), they are highly toxic. A combination of crude oil and dispersants significantly increases their toxicity and potential impact

on microzooplankton and planktonic communities (Almeda, Hyatt & Buskey, 2014). Due to tightly interwoven food chains, high north ecosystems are uniquely vulnerable to substantial disruptions resulting from oil spills (Stouwe, 2017).

The apparent vulnerability of the Arctic environment has led to calls for a moratorium on offshore activities in the Arctic (UKPEC, 2012), especially as the Gulf of Mexico oil spill has shown the difficulty of clean-up even in the significantly more favourable climate and weather conditions (Cunningham, 2012). Oil pollution is slow to disappear, while sub-zero temperatures, darkness and sea ice may impede access to spill-covered areas and reduce the effectiveness of clean-up techniques and operations (National Research Council, 2014).

The frontier's biodiversity is unique but not sufficiently understood. The changing climatic conditions may increase the frequency of storm surges, making it more likely for an oil spill to reach coastlines and damage coastal species (Pew Charitable Trusts, 2013). Another challenge is the fact that regulatory enforcement is extremely difficult in the High North. Regulatory agencies are usually *"captured"* by industry interests, whom they depend upon for personnel and technical expertise. Agencies find it difficult to set adequate standards without corporate assistance, and this power asymmetry tilts the scale in favour of IOCs (Stouwe, 2017).

A Macondo-type disaster would be catastrophic for the Arctic. It is the duty of both relevant national governments and the international and business community to take on this challenge. It has been asserted that IOCs and the Arctic coastal states are far from ready to effectively deal with major oil spills in the Arctic (Nunez, 2014). There is no doubt that the impact of oil pollution on the Arctic ecosystems and vulnerable marine living resources could be devastating and long-lasting. This is so as toxic substances could remain in the marine environment for decades and be transported by ice floes over large distances while affecting wildlife and the pristine environment (Cameron, 2015).

Legal Regime of the Arctic: An Environmental Perspective

The legal regime of the Arctic represents a combination of different global and regional environmental treaties and soft law instruments (Sahu, 2016). The protection of the Arctic is achieved using mainstream and side-stream regulations. Some global conventions, primarily related to the law of the sea, and polar-specifics regulations, including those passed by the Arctic Council, constitute the mainstream regime. Individual efforts of the coastal states to protect their northern shores and waters constitute the side-stream regime (Stouwe, 2017).

Applicable hard law comprises customary rules and relevant treaty provisions that are legally binding and define or prohibit the specific states' conduct (Canuel, 2015). When states consent to implied customary law or treaty-based hard law, they are bound by it, albeit, compliance issues arise sometimes when an international norm conflicts with perceived national interest (ASIL & ILA, 1991). It is a customary international law obligation of a coastal state to ensure that hydrocarbon activities within its marine environment do not result in transboundary environmental harm to other states (Bosma, 2012).

International environmental law and its principles play a vital role in governing various economic activities in the Arctic. UNCLOS and other global treaties, such as the Biodiversity, Persistent Organic Pollutants and the Climate Change conventions, are all relevant in terms of environmental

protection of the Arctic. They provide general guidelines for the protection of the environment during petroleum operations.

Regional legal frameworks also govern some economic activities in the Arctic, at least in certain geographic areas. These include the Convention on the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention).

The Arctic Environmental Protection Strategy (AEPS), a *"soft law"* framework for environmental cooperation, and its successor, the Arctic Council, an intergovernmental forum established in 1996, are also part of the Arctic legal regime, although of a non-binding nature (Nowlan, 2001). The Arctic Council is the main regional institutional mechanism intended to provide a platform for cooperation on various issues among the Arctic states. It does not have a legal personality as an intergovernmental organization, and its regulations are simple recommendations (ibid). It has launched several programmes with mandates relevant to environmental protection. As far as accidental oil pollution arising from E&P activities is concerned, the Arctic environmental regime, as will be shown later, is rather piecemeal compared to other regional seas. While coastal states may have sufficiently developed national regulatory frameworks for offshore E&P operations, the Arctic-wide regime for compensating other coastal states and victims of pollution, including Indigenous peoples, is missing. The fundamental question here is which liability and compensation regime should govern compensation for environmental harm, including transboundary damage, caused by accidents in the Arctic either within the coastal states' jurisdiction or beyond it.

UNCLOS and Other Global Instruments

No special international regime applies to hydrocarbon development in the Arctic (Johnstone, 2016). As earlier stated, such activities are governed by general international law, mainly in the form of 1982 UNCLOS and its implementation agreements (Cinelli, 2014). UNCLOS is often referred to as the "*constitution for the seas*" (Fowler, 2012). Art. 192 of UNCLOS obligates states to protect and preserve the marine environment. UNCLOS codifies the rights of various states, determines the limits of various maritime zones, from the territorial sea to the Exclusive Economic Zones (EEZ) and the continental shelf, and establishes applicable rules associated with marine scientific research in the Arctic, and the rights and responsibilities for marine environmental protection (Joyner, 2009).

Under Article 194 of UNCLOS, there exists a duty to take all necessary measures to prevent, reduce and control pollution of the marine environment. Article 194 (3) expressly refers to "*pollution from installations and devices*" used to explore and exploit natural resources from the seabed and subsoil. In particular, such measures must aim at preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, and regulating the design, construction, equipment, operation and manning of such installations or devices. Clearly, this obligation applies to hydrocarbon E&P in the Arctic.

Further to this general obligation, there are two more specific provisions related to offshore operations - Articles 208 and 214, that directly relate to the prevention and control of operational and accidental marine pollution resulting from offshore E&P. Together these articles embrace both aspects of anti-pollution measures: regulation and enforcement. Article 208 obliges states to adopt laws and regulations that will prevent, reduce and control pollution emanating from seabed activities, and to harmonise and cooperate with other states to create a regional framework to

address marine pollution. Article 214 also deals with the issue of pollution resulting from seabed activities under the jurisdiction of coastal states. It complements Article 208 and operates as an enforcement provision (Vinogradov & Wagner, 1998).

There is one Arctic-specific provision in UNCLOS, which however applies to navigation only. Under Article 234, coastal states have a right to make laws that are non-discriminatory to prevent, reduce and control vessel-related pollution in ice-covered areas within their Exclusive Economic Zones. However, Art. 234 does not provide for an adequate legal mechanism to protect the Arctic environment from other sources (Stouwe, 2017). UNCLOS does not stipulate either the content or procedures that should be followed to prevent such pollution of the Arctic Ocean (Rixey, 2016). Russia and Canada have explicitly referred to Article 234 as the basis for their unilateral introduction of additional environmental regulations and, in the case of Russia, icebreaker escort fees to ensure the safety of the environment and seafarers in their respective Arctic EEZ (Fields, 2015). While this provision applies only to navigation, there is nothing in either UNCLOS or general international law which precludes coastal states from establishing and enforcing stricter measures with respect to offshore E&P operations in their Arctic waters.

Finally, Article 197 calls for environmental cooperation, where appropriate, on a regional basis, directly or through competent international organisations. Such cooperation should focus primarily on formulating and elaborating international rules, standards and international practices and procedures for the protection of the marine environment, taking into account characteristic regional features. The Arctic is a particularly sensitive and vulnerable maritime region where cooperation among its coastal states and other countries using it is essential. From this perspective, it is important to analyse and assess the emerging regional environmental regime of the Arctic Ocean to ascertain its effectiveness, especially regarding petroleum E&P. This is essential as UNCLOS strongly encourages regional solutions to prevent, reduce and control pollution in the Arctic (Stokke, 2009).

Apart from UNCLOS, there are several international conventions aimed at protecting the marine environment which were adopted under the auspices of the International Maritime Organisation. The most relevant among them in the context of this paper are the International Convention on Civil Liability for Oil Pollution Damage (CLC) of 1992, the Fund Convention of 1992, and the 2003 Supplementary Fund, which may offer possible solutions for the Arctic. The aim of the CLC 1992 was to ensure adequate compensation for victims of vessel-based accidental pollution damage. The CLC provides for a strict liability regime against a ship owner with limited exceptions for acts of war, third party intentional acts, and the wrongful acts of an authority responsible for navigation (Art. 3, CLC 1992). The strict liability approach was chosen to ensure optimal compensation to the victims of accidental pollution (Hui, 2007).

The CLC requires mandatory insurance to cover ship owner's liability (Art. 7, CLC 1992) essentially to guarantee such compensation (Verheij, 2007). The limit of the ship owner's liability is calculated based on the tonnage of the vessel (Art. 5, CLC 1992), and victims could claim directly from the ship owner's insurer or the provider of the financial security (Art. 7 (8), CLC 1992). After the 2000 amendment, the maximum amount payable by a ship owner is 89,770,000 Special Drawing Rights (SDR). However, the CLC has been criticised for having a low maximum amount which may not compensate for a large-scale damage, thus defeating the goal of prompt and adequate compensation set out by the regime (Mason, 2002).

To accommodate this criticism, the 1992 Fund was established to provide compensation for victims who do not obtain full compensation under the CLC. The 1992 Fund functions as an alternative source of payments and as a second-tier compensation mechanism for claim settlement (Art. 3 (2), CLC 1992). Thus, it provides victims with realistic opportunities of recourse, and a wider scope of claims application (Pavliha & Grbec, 2008). Through contributions from the shipping and oil industry, compensation is available under the CLC and Fund regime, thus facilitating risk spreading between different parties.

Despite the seemingly wide scope of the Fund and substantial amount available, subsequent incidents demonstrated that the CLC and the Fund were inadequate to provide compensations in the most severe cases, as some claims may surpass the liability limit under the two instruments (Hui, 2011). The combined amount of compensation available under the CLC and Fund was 203 million SDR. This limitation paved the way to the adoption of the 2003 Supplementary Fund Protocol to ensure availability of adequate funds for compensation payment. The limit was increased to 750 million SDR (Art. 4, 2003 Fund Protocol). The 2003 Fund operates as an additional tier of compensation and applies when the joint coverage under the CLC and the 1992 Fund is insufficient. It is derived from levies collected from companies situated in the contracting states that receive more than 150,000 tons of oil per year (Art. 10, 2003 Fund Protocol). Yet, the liability limit under the 2003 Fund is still inadequate in addressing potential damage caused by a major spill in the Arctic.

The regime has achieved a balance between various competing interests as it continues to ensure prompt and adequate payment of compensation for pollution damage. The entire CLC regime offers certain options for the Arctic region. The success of the CLC as a model for developing an international liability mechanism for the marine transportation of hazardous and noxious substances is an indication of its likely applicability in the Arctic region.

Regional Environmental Frameworks in the Arctic

It has been earlier mentioned that there is no single regional convention governing the environmental protection of the Arctic Ocean, including offshore oil and gas activities. What is currently in place is a combination of some regional binding and soft law instruments in the form of numerous guidelines and recommended practices. This could relate to the fact that the Ottawa Declaration on the Establishment of the Arctic Council does not impose legally binding responsibilities on any of its members and that the Arctic Council is also not authorised to do so (Koivurova & Molenaar, 2009). The Arctic Council's position and role could and should be strengthened to improve the effectiveness of environmental cooperation.

The most relevant regional environmental regime which applies partly to the areas under the jurisdiction of some Arctic states is the OSPAR Convention. It was open for signature at the Ministerial Meeting of the Oslo and Paris Commissions on 22 September 1992. The OSPAR Convention replaced two instruments concerning land-based pollution and dumping adopted in the early 1970s. It provides a broad normative framework and an institutional mechanism (the OSPAR Commission) for regional cooperation. One important feature of the OSPAR regime is its geographical coverage, which includes Region I (Arctic waters) that constitutes approximately 40% of the OSPAR maritime area.

In addition to the general obligation regarding the prevention and elimination of pollution from "offshore sources" (Article 5), it has Annex III regarding offshore installations. However, neither the OSPAR Convention, nor its Annex III contain technical requirements and standards, leaving this to be developed by the Commission through its agreements, decisions and recommendations. The OSPAR Convention focuses almost entirely on regulating operational pollution and the disposal of disused offshore platforms (Vinogradov, 2013).

Some soft law instruments embrace internationally accepted technical norms, standards and practices that have been institutionalised (Koivurova et al., 2015). Although they influence states' behaviour, they do not create an excessive burden or obligation on the respective states. Soft law instruments play an important role in shaping the actor's behaviour, both in terms of their general conduct and, especially, when it comes to regulating some specific industrial or commercial activities. The Arctic Council has produced important guidelines, including the 2009 Arctic Offshore Oil and Gas Guidelines. The purpose of the guidelines is for the Arctic nations to use them during petroleum operations by applying common policy and practices (Arctic Council, 2009d). The objective is to assist regulators in designing standards, which are applied and enforced consistently for all offshore hydrocarbon operators in the Arctic. The guidelines are non-binding and are intended only to encourage the application of the highest standards of petroleum operations. The Council's various task forces, working groups, and adopted documents aimed at achieving the Council's twin aims - environmental protection and sustainable development of the Arctic natural resources (Canuel, 2015).

In 2013, the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic was adopted to serve as a legal platform for prompt and effective action and cooperation in the event of an oil pollution incident. In 2015, the Arctic Council approved the "Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and Maritime Activities in the Marine Areas of the Arctic" (Framework Plan). The Framework Plan aims to strengthen cooperation, including exchange of information, in the field of prevention of marine oil pollution.

However, both the hard law instruments and soft law guidelines are practically silent on the issue of accidental oil pollution damage to the environment and this question requires more detailed analysis which will follow.

Accidental Oil Pollution Liability and Compensation in the Arctic

Current Status

While accidental oil pollution is one the most serious issues that threatens the Arctic, the region does not have a proper legal regime that addresses liability and compensation for damage arising from E&P activities. Although various national laws govern hydrocarbon E&P in the Arctic waters, these regulations are not harmonised, neither do they provide adequate protection to the victims of pollution in the case of transboundary environmental harm. There are considerable differences in relevant national regimes which can lead to ambiguities and unnecessary delays and inadequate compensation (Lahn & Emmerson, 2012). As states look to address the unique challenges of regulating offshore drilling activities in the Arctic region, a major concern is the liability limits set out in national regulations (Byers, 2012). The liability for offshore pollution damage in Russia, Norway and Greenland is unlimited, whereas that of US and Canada is limited

(Lahn & Emmerson, 2012). The US Oil Pollution Act of 1990 sets the limit of liability at $75 million for economic and natural resource damage, although no limit standard applies for gross negligence (33 U.S.C S2701 of OPA). Liability for offshore pollution damage in the Canadian Arctic is $40 million under the 1970 Arctic Waters Pollution Prevention Act.

A fundamental question with respect to liability for pollution damage in the Arctic is which liability regime should apply. Stakeholders in the Arctic region have expressed divergent views on this issue. Non-governmental organisations in the region argue that the liability cap should be removed. The reason advanced is that the environment is vulnerable, the climate is harsh, and that there is no precedent to base cost assessment for damage caused to the environment (Lahn & Emmerson, 2012). Some scholars posit that liability caps prevent cost internalisation and can facilitate activities that do not make economic sense from an inclusive viewpoint (Byers, 2012). Oil companies and some states hold a contrary view. Unlimited liability is usually assumed to create a risk too great for investors as it does not ensure certainty in insurance, although some investors may accept it as a way of covering for the current and future loss of fishing revenues by locals (Vanderklippe, 2011)

Again, how to address victims' claims where the liability limit is low, and what limit of financial responsibility to apply, is an issue of debate in the Arctic region (Lahn & Emmerson, 2012). In the U.S, the demonstration of financial capacity is set at 150 million USD. In Greenland, the 2010 Baffin Bay licensing rounds required companies to have at least 10 billion USD of equity to qualify, and small companies were required to provide a 2 billion USD bond for clean-up in the event of a spill (Webb, 2010). States and companies may be unable to act alone in the event of a disaster and the liability regime of a state may limit victims' claims as the amounts vary (Lahn & Emmerson, 2012). It therefore seems necessary to harmonise national regimes in the Arctic region for a more effective liability framework.

Under Article 235 of UNCLOS, states are obligated to ensure that recourse is available for adequate compensation or other relief, and to ensure this, it is the duty of states to cooperate in the implementation of existing international law, and the development of the law regarding liability and compensation for marine pollution damage. This provision also emphasises the need for the development of criteria and procedures, such as compulsory insurance or compensation funds, for payment of adequate compensation. This highlights the importance of a robust and streamlined regime that would allow for adequate compensation and a well-considered liability limit in the fragile Arctic region.

At present "existing international law" relating to liability and compensation for oil damage to the marine environment is limited to accidental pollution arising from navigation only. There is a well-established global regime governing civil liability for pollution damage caused by maritime accidents involving transportation of oil. However, nothing of this kind at either the global or regional level exists with respect to petroleum E&P. The 1977 Convention on Civil Liability for Oil Pollution Damage that could have been relevant, is not in force and in practical terms is obsolete. Thus, in view of the advent of large-scale E&P operations in the Arctic there is a clear need to consider adequate liability and compensation schemes and mechanisms with respect to offshore pollution, if not global, at least regional, especially for the vulnerable Arctic Ocean.

Options for Liability and Compensation Schemes

In the face of environmental challenges and increasing economic activities in the Arctic, questions have been raised over the sufficiency of the existing regime to manage and protect this frontier region (Stokke, 2009). This paper identified as one such issue the absence of a regional liability and compensation scheme for damage caused by E&P activities in the Arctic. As IOCs look towards expanding their operations in this region, one may consider various options to fill this obvious gap, including primarily two: an industry-specific private compensation mechanism modelled on the OPOL scheme and a regional intergovernmental civil liability regime.

Using the OPOL-type Framework

One possible solution in addressing the regime gap in the Arctic is an OPOL-type framework for pollution liability arising from the hydrocarbon E&P operations. The Offshore Pollution Liability Association Limited is an industry body in the oil sector, set up as a company limited to administer a voluntary but strict liability compensation scheme known as the Offshore Pollution Liability Agreement (OPOL) (Faure & Liu, 2017). The OPOL is an agreement between several major oil companies, intended to make compensation available to the victims of oil pollution damage emanating from an offshore facility or reimbursement to public authorities for remedial measures carried out following a spill (Clause IV, OPOL). OPOL was designed to fill the gap in the UK pending the ratification of the 1977 Convention on Civil Liability for Oil Pollution Damage Resulting from Exploration for and Exploitation of Seabed Mineral Resources (1977 CLEE) (Rochette, Wemaere, Chabason & Callet, 2014). However, the CLEE was never ratified, and OPOL remains the only instrument at present to address the issue of accidental pollution liability not only in the North Sea and adjacent areas, but globally.

OPOL's origin is traceable to the UK. It entered into force on 1 May 1975 as an agreement between all offshore operators in the UK (Faure & Liu, 2017). Its coverage was extended to offshore facilities within the jurisdiction of other states: Denmark, the Federal Republic of Germany, France, the Republic of Ireland, the Netherlands, Norway, the Isle of Man, the Faroe Islands and Greenland. This means that OPOL applies to some Arctic waters.

The legal nature of the OPOL agreement is a contractual arrangement by offshore installation operators (Bonfanti & Jacur, 2014) and is based on the principle of a strict but limited liability. Membership of OPOL is a condition for the granting of a licence in the UK (Faure & Liu, 2017). Outside the UK, OPOL membership has declined as there is no regulatory duty to be a member in states such as Germany, France or Denmark (Faure & Liu, 2017). Presently, the total liability of an operator under OPOL is capped at 250 million USD per incident, with a requirement for members to "establish and maintain" financial responsibility to ensure that claims are met (Clause II 2c, OPOL), evidenced through insurance or self-insurance (Rochette et al., 2014). Claims to be considered as admissible include clean-up operations on shore or at sea, property damage, disposal costs of collected material, other losses which must be quantifiable, and which must result directly from the contamination. OPOL does not take away a claimant's right to seek redress through the courts for losses exceeding the recoverable maximum, or those beyond the scope of the Agreement.

A commendable feature of the OPOL regime is that it appears to demonstrate the industry's commitment to make available adequate coverage of pollution damage. Again, if a member is

unable to meet its obligation due to insolvency, other members are obligated to contribute in proportion to the number of their offshore facilities at the time of the incident. This guarantees that funds are available to meet claims, thus, ensuring expeditious claims settlement and enhancing mutual risk sharing in the case of insolvency. Furthermore, the strict liability obligation means that there is no need to prove fault, and the fact that liability is channelled to the operator takes away the question of attribution of liability when claims are to be lodged.

There are, however, limitations to OPOL. It is not a fund but a contractual arrangement to compensate losses where a member fails to meet its obligation (Hancock & Stone, 1982). It means that OPOL will not intervene where there is no insolvency. OPOL does not prevent a claimant from suing the operator for other types of damages (Faure & Liu, 2017). Its definition of direct loss or damage appears limited in scope. Whether damage caused to the environment falls under this definition is debateable (Rochette et al., 2014). Finally, OPOL's liability limit pales in comparison with the extent of damage occasioned by the Deepwater Horizon incident in the Gulf of Mexico (Smith, 2011).

Although the OPOL's compensation limit is quite high, it may still be inadequate in the event of a major offshore catastrophe. However, it is unclear whether the industry will be willing to raise the limit to a point that assures adequate compensation. Recalling that the Arctic has a challenging environment and a fragile ecosystem, a major oil spill in its waters could result in huge damage. OPOL has not been tested, and the adequacy of its application in the Arctic may be questionable. Nevertheless, OPOL demonstrates a potential governing option for liability and compensation for E&P activities in the Arctic region, if expended or modelled upon. This is so as it was established by operators (Churchill, 2001). OPOL can be improved by increasing the limit of liability to cover a Macondo-type damage; setting up a fund to address claims in excess of the liability limit. Some OPOL "designated states" are also members of the Arctic Council, thus, the regime will not be entirely new to them.

Creating a Regional Liability Regime

Another possible solution is to create a legally binding Arctic-wide framework establishing a liability regime for the region similar to the 1977 CLEE. The CLEE is restricted to the coastal states of the North Sea, Baltic Sea and the northern parts of the Atlantic Ocean (Sands, 2003). It is based on strict but limited liability channelled to the operator. However, the operator could be exempted from liability where the damage was caused by an act of God or from a well abandoned for longer than 5 years (Churchill, 2001). The Convention applies to petroleum operations on the seabed and covers fixed and mobile facilities offshore. The Convention deals with accidental oil pollution emanating from the coastal state's jurisdiction, damages suffered because of the spill and compensation payable. It imposes a requirement of mandatory insurance for operators.

Under the CLEE regime, there is no provision for a supplementary fund. Yet, it allows states where the offshore facility is situated to prescribe higher or unlimited liability for pollution damage. It must be reminded that the CLEE has never entered into force. This can be explained by disagreements regarding the standard and limitation of liability; lack of political will on the part of states to agree on important aspects of the convention; the absence of a separate fund to provide compensation for claims in excess of the limit of liability; states interest in uniformity of laws as opposed to states interest in stricter regulations for offshore operations; and disagreements regarding the potential magnitude of risk involved, among other reasons (Dubais, 1977).

A look at the regime established by the CLEE reveals some serious shortcomings. The absence of a supplementary fund undermines the effectiveness of the regime where claims exceed the liability limit. The power of states to establish a higher limit of liability could create non-uniformity, contrary to the aim of harmonisation of rules and procedure as stated in the preamble of the Convention. Again, the operators were required to maintain insurance or financial security as a cover for liability, however, states could independently determine the amount, type and terms of the insurance. This could result in non-uniformity as well. The CLEE was criticised for setting a low liability limit of 35 million SDR (Ibid.).

However, all the obvious shortcomings of the CLEE model do not necessarily negate this approach in principle as a possible option for the Arctic. Intergovernmental environmental frameworks adopted at the regional level, albeit not in the area of civil liability for accidental damage, have shown significant advantages due to their legally binding character and uniformity of the regulatory approach.

Conclusion

The analysis of different options discussed above from the viewpoint of an optimal model to be used in the Artic region, reveals that the applicability of a liability and compensation regime for oil pollution damage from offshore E&P operations may depend on several key factors. A strict but limited liability is essential to facilitate prompt and adequate compensation for damage caused by E&P activities. It enables cost internalization, and guarantees compensation irrespective of operator's fault, especially in the oil industry's complex contracting chain. It is also the prescribed standard for ultra-hazardous and high-risk activities such as offshore E&P (ILC, 2003). The strict liability requirement should be balanced with a liability limit to encourage its acceptance by the industry and ensure the availability of insurance to operators. Legal certainty is guaranteed in the insurance market when liability is strict but limited (Faure, 2009).

Again, liability should be channelled to the operator as it enables the victim to identify the responsible party for the purpose of compensation. This is so as the operator is the party that designs the well programme, interfaces with the government, and receives the long-term financial upside from the petroleum operation (Cameron, 2012). The operator could still contractually allocate risks to other participants during E&P operations. Furthermore, the regime should provide for compulsory insurance or evidence of financial security to guarantee claims payment. Offshore energy insurance is one of the prerequisite conditions for the development of an international regime on liability for pollution damage (Shaw, 2012).

The choice of options in terms of the final legal shape of the possible liability regime is rather limited. On the one hand, one may consider developing a proper intergovernmental legal framework analogous to the CLEE. However, the failed attempt to create such a regime in the maritime area famous for a very high degree of cooperation among the coastal states concerned does not bode well for its success in a divided and politically controversial regime such as the Arctic Ocean. Thus, on the other hand, what is more feasible is to apply the OPOL or develop an OPOL-type mechanism. At present OPOL, as a voluntary compensation scheme, provides an adequate platform for remedial action by operators of offshore facilities in the event of a spill. One substantial advantage of this scheme is the fact that it already applies by some of the Arctic or sub-Arctic countries. It will not be particularly hard to extend the territorial scope of the scheme to

other Arctic countries. Or, alternatively, one may contemplate the establishment of a similar compensation scheme for the Arctic waters exclusively. Either option has advantages and shortcomings, which require further deliberation.

An additional tier of compensation in the form of a supplementary fund may also be considered at some point. It would provide a wider scope for settling claims, especially when the damage significantly exceeds the established limit. Its funding could come from the oil industry and states as they are stakeholders too. State contribution could be based on the amount of oil produced or well drilled in a given jurisdiction. The Arctic Council may hypothetically be entrusted with managing such a supplementary fund. The liability regime should be able to facilitate prompt and adequate compensation by removing barriers that may prevent recourse, considering the potential magnitude of the risk and taking a cue from the extent of damage caused by the Deepwater Horizon incident.

The Arctic states should exercise the political will and commit to a regional regime that will be adequate to provide necessary guarantees to both public authorities and juridical and physical persons in the event of an oil spill. Accidental pollution associated with offshore E&P activities, including large-scale discharge of oil, creates a very high environmental risk. In the light of the Macondo incident in the Gulf of Mexico and the Montara spill in the Sea of Timor, the need for a regional regulatory framework designed to deal with liability issues, which arise from oil pollution damage caused by offshore E&P, is obvious. While there are possible options available to the Arctic states, the most realistic would be to develop an industry-wide framework, which would cover all operators engaged in offshore E&P in the Arctic. This regime could be modelled on a modified version of the OPOL scheme and other conventions discussed, taking into consideration their key positive features.

The Arctic states should be able to harmonize their policies at the appropriate regional level, and develop regional rules, standards and recommended practices and procedures to address oil pollution from offshore facilities (Vinogradov, 2013). There have been suggestions to impose a moratorium on offshore activities until a strong civil liability regime, among other things, has been created in the Arctic (Johnstone, 2016). While this proposal may be viewed as extreme, there is indeed a need in a more vigorous cooperative effort to develop international law and adequate mechanisms to deal with the issue of liability and compensative on a regional level in the Arctic.

References

1977 Convention on Civil Liability for Oil Pollution Damage Resulting from Exploration for and Exploitation of Seabed Mineral Resources adopted in London, United Kingdom on 1 May 1977.

Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic, 15 May, 2013, entry into force March 2016. Retrieved from https://arctic-council.org/index.php/en/our-work/agreements.

Arctic Council. (2009a, April 29). Arctic Marine Shipping Assessment 2009 Report. Retrieved from https://oaarchive.arctic-council.org/handle/11374/54

Arctic Council. (2009b, April 29). Arctic Offshore Oil and Gas Guidelines, 2009. Retrieved from https://pame.is/images/03_Projects/Offshore_Oil_and_Gas/Offshore_Oil_and_Gas/Arctic-Guidelines-2009-13th-Mar2009.pdf

Arctic Council. (2009c). Arctic Marine Shipping Assessment 2009 Report. Retrieved from https://pame.is/images/03_Projects/AMSA/AMSA_2009_report/AMSA_2009_Report_2nd_print.pdf

Arctic Council. (2009d). Arctic Offshore Oil and Gas Guidelines, 2009. Retrieved from https://oaarchive.arctic-council.org/handle/11374/63

Arctic Council. (2011). 2011 Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic. Retrieved from https://oaarchive.arctic-council.org/bitstream/handle/11374/531/EDOCS-3661-v1-ACMMDK07_Nuuk_2011_SAR_Search_and_Rescue_Agreement_signed_EN_FR_RU.PDF?sequence=5&isAllowed=y

Arctic Council. (2013). Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. Appendix IV, p.11 Operational Guidelines, Retrieved from https://oaarchive.arctic-council.org/bitstream/handle/11374/529/EDOCS-2068-v1-ACMMSE08_KIRUNA_2013_agreement_on_oil_pollution_preparedness_and_response_signedAppendices_Original_130510.PDF?sequence=6&isAllowed=y

Almeda, R., Hyatt, C., & Buskey, E. J. (2014). Toxicology of dispersant Corexit 9500A & crude oil to marine microzooplankton. *Ecotoxicology and Environmental Safety*, 106, 76-85.

Baev, P. (2007, October). Russia's race for the Arctic and the new geopolitics of the North Pole. *Occasional Paper, The Jamestown Foundation,* Retrieved from https://jamestown.org/wp-content/uploads/2007/10/Jamestown-BaevRussiaArctic_02.pdf

Baker, B. (2013). Offshore oil and gas development in the Arctic: What the Arctic Council and international law can - and cannot – do. *American Society of International Law Proceedings*, 107, 275-279.

Bishop, A., Bremner, C., Laake, A., Parno, P., & Utskot, G. (2011). Petroleum potential of the Arctic: Challenges and solutions. *Oilfield Review*, *22* (4), 36-49.

Bonfanti, A., & Jacur, F. R. (2014). Energy from the Sea and the protection of the marine environment: Treaty-Based regimes and ocean corporate social responsibility. *The International Journal of Marine and Coastal Law*, 29(4), 622-644.

Bosma, S. (2012). The regulation of marine pollution arising from offshore oil and gas activities – An evaluation of the adequacy of the current regulatory regimes and the responsibility of states to implement a new liability regime. *Australian & New Zealand Maritime Law Journal*, 26, 89-117.

Byers, M. (2012, September 27). Circumpolar challenges: An ambitious agenda for the Arctic Council. *Pre-conference Report*, Retrieved from http://www.rideauinstitute.ca/wp-content/uploads/2012/09/Byers-Arctic-Council-pre-conf-report-web.pdf

Cameron, E. (2015, August 28). The impact of offshore oil drilling in the Arctic. *Peace Palace Library*, Retrieved from https://www.peacepalacelibrary.nl/2015/08/the-impact-of-offshore-oil-drilling-in-the-arctic/

Cameron, P. (2012). Liability for catastrophic risk in the oil and gas industry. *International Energy Law Review,* 6, 207-219.

Canuel, E. T. (2015). The four Arctic law pillars: A legal framework. *Georgetown Journal of International Law*, 46, 5-764.

Christina Nunez. (2014, April 24). What happens when oil spills in the Arctic? *National Geographic*, Retrieved from https://news.nationalgeographic.com/news/energy/2014/04/140423-national-research-council-on-oil-spills-in-arctic/

Churchill, R. B. (2001). Facilitating (Transnational) civil liability litigation for environmental damage by means of treaties: Progress, problems, and prospects. *Yearbook of International Environmental Law*, 12(1), 3-41.

Cinelli, C. (2014). Protection and preservation of the Arctic marine environment. *Italian Yearbook of International Law*, *24*,159-189.

Committee on Arctic Research. (2015, March 31). Arctic Potential: Realising the Promise of U.S. Arctic Oil and Gas Resources. *National Petroleum Council, Pre-Publication Edition*, Retrieved from http://www.npcarcticpotentialreport.org/pdf/AR_Exec_Summary.pdf

Convention for the Protection of the Marine Environment of the North-East Atlantic, (OSPAR Convention) September 22, 1992.

Cunningham, N. (2012, July 17). Offshore oil drilling in the US Arctic, Part Two: The legacy of deepwater horizon. *The Arctic Institute*, Retrieved from https://www.thearcticinstitute.org/offshore-oil-drilling-in-us-arctic-part2/

Declaration on the Establishment of the Arctic Council, Ottawa, (Ottawa Declaration) Canada, September 19, 1996.

Dubais, B. A. (1977). The 1976 London Convention on Civil Liability for Oil Pollution Damage from Offshore Operations. *Journal of Maritime Law and Commerce*, 9(1), 61-78.

E&P Forum, and UNEP. (1997). Environmental management in oil and gas exploration and production: An overview of issues and management approaches. *Joint E&P Forum/UNEP Technical Publication*, Retrieved from http://wedocs.unep.org/bitstream/handle/20.500.11822/8275/-Environmental%20Management%20in%20Oil%20%26%20Gas%20Exploration%20%26%20Production-19972123.pdf?sequence=2&isAllowed=y

Ebinger, C., Banks, J. P., & Schackman, A. (2014). Offshore oil and gas governance in the Arctic: A leadership role for the U.S. *Brookings Institution*. Retrieved from https://www.brookings.edu/wp-content/uploads/2016/02/Offshore-Oil-and-Gas-Governance-web.pdf

Endeavor. (2014, September 3). Offshore Arctic exploration and production: An opportunity with many challenges. *Endeavor Management*, Retrieved from https://www.endeavormgmt.com/wp-content/uploads/2015/03/Offshore-Arctic-Exploration-and-Production.pdf

Faure, M., & Liu, J. (2017). Pooling Mechanism for Offshore Liability. in M. Faure, (Ed.), *Civil Liability and Financial Security for Offshore Oil and Gas Activities* (pp.200-230). Cambridge: Cambridge University Press.

Faure, M. (2009). Regulatory strategies in environmental liability. in F. Cafaggi, & H. M, Watt. (eds.), *The Regulatory Function of European Private Law* (129-148) Cheltenham: Edward Elgar Publishing.

Fields, S. P. (2015). Article 234 of the United Nations Convention on the Laws of the Sea: The overlooked linchpin for achieving safety and security in the U.S. Arctic. *Harvard National Security Journal*, 7, 57-109.

Fowler, D. (2012). Offshore oil: A frontier for international law-making. *Chicago-Kent Journal of International and Comparative Law*, 12 (1), 179-192.

Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and Maritime Activities in the Marine Areas of the Arctic. (2015). *IQALUIT 2015 SAO REPORT TO MINISTERS*, Retrieved from https://oaarchive.arctic-council.org/bitstream/handle/11374/609/ACMMCA09_Iqaluit_2015_SAO_Report_Annex_3_TFOPPFramework_Plan.pdf?sequence=1&isAllowed=y

Gordeeva, T. S. (2013). Identification of criteria for selection of Arctic offshore field development concept (Master's Thesis). *University of Stavanger, Norway*. Retrieved from https://brage.bibsys.no/xmlui/handle/11250/183099

Hancock, W. N., & Stone, R.M. (1982). Liability for Transnational Pollution Caused by Offshore Oil Rig Blowouts. *Hastings International and Comparative Law Review*, 5(2), 377-395.

Henderson, J., & Loe, J. S. (2014, November). The prospects and challenges for Arctic oil development. *Oxford Institute for Energy Studies, WMP 54,* Retrieved from https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/11/WPM-56.pdf

Hui, W. (2007). Shifts in governance in the international regime of marine oil pollution compensation: A legal history perspective. in M. Faure, & A. Verheij (eds.), *Shifts in Compensation for Environmental Damage* (pp197-215) New York: Springer.

Hui, W. (2011). Civil liability for marine oil pollution damage: A comparative and economic study of the international, U.S and Chinese compensation regime. (173-), Netherland: Kluwer Law International

International Convention on Civil Liability for Oil Pollution Damage, 1992.

International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 (with annex and process verbal of rectification). Concluded at London on 30 November 1990, entry into force 13 May 1995.

International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992.

International Law Commission. (2003). Report of the International Law Commission Fifty-fifth session (5 May-6 June and 7 July-8 August 2003). *General Assembly Official Records Fifty-eighth session Supplement No. 10 (A/58/10),* Retrieved from http://legal.un.org/ilc/documentation/english/reports/a_58_10.pdf

Johnstone, R. L (2016). Respectful neighbourliness: The United Kingdom's Arctic approach. *The YEARBOOK of Polar Law, .8*, 27 -55.

Johnstone, R. L. (2015). *Offshore oil and gas development under international law: Risk and responsibility.* Leiden: Brill/Nijhoff.

Johnstone, R. L. (2016). Offshore oil and gas development in the Arctic under international Law: Risk and responsibility. (Book note), *George Washington International Law Review*, *48*, 501-503.

Joint Committee Established by the American Society of International Law & the American Branch of the International Law Association., "The Role of the Legal Adviser of the Secretary of State*", American Journal of International Law*, Vol.85, 1991, p.359.

Joyner, C. C. (2012). The legal regime for the Arctic Ocean. *Journal of Transnational Law and Policy*, *18* (2), 195-245.

Kaiser, B. A., Fernandez, L. M., & Vestergaard, N. (2016). The future of the marine Arctic: Environmental and resource economic development issues. *The Polar Journal, 6* (1), 152-168.

Koivurova, T. (2012). The Arctic Council: **A** testing ground for new international environmental governance. *Brown Journal of World Affairs*, 19 (1), 131-144.

Koivurova, T., & Molenaar, E. J. (2009, January). International governance and regulation of the Marine Arctic: Overview and gap analysis. *A report prepared for the WWF International Arctic Programme*, Retrieved from http://re.indiaenvironmentportal.org.in/files/gap_analysis_marine_resources_130109.pdf

Koivurova, T., Kankaanpaa, P., & Stepien, A. (2015). Innovative environmental protection: Lessons from the Arctic. *Journal of Environmental Law*, 27, 285- 311.

Kontorovich, A. E., Epov, M. I., Burshtein, L. M., Kaminskii, V. D., Kurchikov, A. R., Malyshev, N. A., Prisch, O. M., Safronov, A. F., Stupakova, A. V., & Suprunenko, O. I. (2010). Geology and hydrocarbon resources of the continental shelf in Russian Arctic Seas and the prospects of their development. *Russian Geology and Geophysics, 51* (1), 3-11.

Lewis, A., & Prince, R. C. (2018). Integrating dispersants in oil spill response in the Arctic and other icy environments. *Environmental Science & Technology*, 52(11), 6098-6112.

Lahn, G., & Emmerson, C. (2012, April, 1). Arctic Opening: Opportunity and risk in the high North. Lloyd's & Chatam House, Retrieved from https://www.chatamhouse.org/sites/default/files/publications/0412arctic.pdf

Mason, M. (2002). Transnational compensation for oil pollution damage: Examining changing spatialities of environmental liability. LSE Research Online, Retrieved from http://eprints.lse.ac.uk/570/1/RPESA-no69%282002%29.pdf

Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 16 September 1987, entry into force 1989.

Murray, J. (2018, March 1). Re-examining Arctic Potential. *E&P Magazine,* Retrieved from https://www.epmag.com/re-examining-arctic-potential-1685106#p=full

National Research Council. (2014). *Responding to Oil Spill in the US Arctic Marine Environment*. Washington: The National Academy Press.

Newman, D., Biddulph, M., & Binnion, L. (2014). Arctic energy development and best practices on consultation with indigenous peoples. *Boston University International Law Journal, 32* (2), 449-508.

Nowlan, L. (2001). *Arctic legal regime for environmental protection*. Retrieved from https://www.peacepalacelibrary.nl/ebooks/files/EPLP44EN.pdf

Offshore Energy Today. (2014, June 9). Eni reaches 25,000 bopd production goal at Nikaitchuq field, Alaska. Retrieved from https://www.offshoreenergytoday.com/eni-reaches-25-000-bopd-production-goal-at-nikaitchuq-field-alaska/

Offshore Pollution Liability Agreement ("OPOL") (effective as of 21 June 2017).

Oil Pollution Act of 1990 - Public Law 101-380 (33 U.S.C. 2701 et seq.; 104 Stat. 484.

Osofsky, H. M., Shadian, J., & Fechtelkotter, S. L. (2016). Arctic Energy Cooperation. *University of California, Davis Law Review*, *49*, 1435 – 1510.

Østhagen, A. (2013, April 16). Arctic oil and gas: Assessing the Potential for hydrocarbon development in the Polar Region", *The Arctic Institute, Centre for Circumpolar Security Studies*, Retrieved from https://www.thearcticinstitute.org/arctic-oil-and-gas-hype-or-reality/

PAME. (2014, March). Arctic offshore oil and gas guidelines: System safety management and safety culture. Retrieved from https://oaarchive.arctic-council.org/bitstream/handle/11374/418/Systems%20Safety%20Management%20and%20Safety%20Culture%20report.pdf?sequence=1&isAllowed=y

Pavliha, M., & Grbec, M. (2008). The 2003 Supplementary Fund Protocol: An important improvement to the international compensation system for oil pollution damage. *Zbornik PFZ*, 58(1), 307-332.

Rixey, C. M. (2016). Oil and sustainability in the Arctic Circle. *Denver Journal of International Law and Policy, 44*(4), 441-452.

Protocol of 2003 to the International Convention on The Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992, Retrieved from http://treaties.fco.gov.uk/docs/pdf/2012/TS0048.pdf

Rochette, J., Wemaere, M.., Chabason, L., & Callet, S. (2014, February 1). Seeing beyond the horizon for deepwater oil and gas: Strengthening the international regulation of offshore exploration and exploitation. *Studies N°01/14, IDDRI, Paris, France*, Retrieved from https://www.iddri.org/sites/default/files/import/publications/st0114_jr-et-al._offshore-en.pdf

Rosneft. (2014, September 27). Rosneft discovered a new hydrocarbon field in the Kara Sea. *Rosneft*, Retrieved from https://www.rosneft.com/press/today/item/175413/

Rosneft. (2018). Offshore projects. Rosneft, Retrieved from https://www.rosneft.com/business/Upstream/Offshoreprojects/#a1

Russia International Affairs Council. (2015). Arctic oil and gas resources development: Current situation and prospects. Retrieved from http://russiancouncil.ru/en/arcticoil

Sahu, M. K. (2016). Arctic legal system: A new sustainable development model. *Russian Law Journal*, Vol.4 (2), 83-95.

Sands, P. (2003). *Principles of International environmental law*. Cambridge: Cambridge University Press

Scarpa, F. (2014). EU, the Arctic, and Arctic indigenous peoples. *The Yearbook of Polar Law*, 6, 427- 465.

Schofield, C. H. & Potts, T. (2008). Current legal developments: The Arctic. *International Journal of Marine and Coastal Law, 23* (1), 151-176.

Shaw, R. (2012). Regulation of offshore activities – Pollution liability and other aspects. *The Comité Maritime International (CMI) Yearbook,* 302.

Smith, J. J. (2014). International law and the Arctic: The Law of the Sea and the Polar Regions: Interactions between global and regional regimes. *Canadian Yearbook of International Law*, 52, 653 -665.

Smith, M. (2011). The Deepwater Horizon disaster: An examination of the spill's impact on the gap in international regulation of oil pollution from fixed platforms. *Emory International Law Review*, 25(3), 1477-1516.

Stokke, O. S. (2009). Protecting the Arctic environment: The interplay of global and regional regimes. *Yearbook of Polar Law*, 1, 365- .

Stouwe, E. V. (2017). An Arctic peril: The pitfalls and potential of a fragmentary polar law. *Brooking Journal of International Law*, 43 (1), 191-232.

The Guardian. (2011, July 5). Exhausted global oil supplies make Arctic the new hydrocarbon frontier. *The Guardian Online*, Retrieved from https://www.theguardian.com/environment/2011/jul/05/oil-supplies-arctic

The Guardian. (2010, July 22). BP oil spill time line: Deepwater horizon oil spill. *Guardian Research*, Retrieved from https://www.theguardian.com/environment/2010/jun/29/bp-oil-spill-timeline-deepwater-horizon

The Pew Charitable Trusts. (2013, September 23). Arctic standards: Recommendation on oil spill prevention, response, and safety. A Report, Retrieved from https://www.pewtrusts.org/en/research-and-analysis/reports/2013/09/23/arctic-standards-recommendations-on-oil-spill-prevention-response-and-safety

Tippee, J. (2015). Arctic E&P activity on the rise. *Offshore Magazine*, 75 (5), 23-27.

United Kingdom Parliament Environmental Committee, (UKPEC). (2013). Protecting the Arctic. *Second Report of Session, 2012-13,* Vol. 1, Retrieved from https://publications.parliament.uk/pa/cm201213/cmselect/cmenvaud/171/171.pdf

United Nations Convention on the Law of the Sea, 10 December 1982, 1833 *U.N.T.S.* 397.

United Nations Framework Convention on Climate Change, May 9, 1992, reprinted in 31 I.L.M. 851.

United States Geological Survey (USGS). (2008). Circum-Arctic resources appraisal: Estimates of undiscovered oil and gas north of the Arctic Circle. *USGS Fact Sheet 2008-3049*, Retrieved from https://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf

United States Geological Survey (USGS). (2017, December). Assessment of Undiscovered Oil and Gas Resources in the Cretaceous Nanushuk and Torok Formations, Alaska North Slope, and Summary of Resource Potential of the National Petroleum Reserve in Alaska, 2017. *Fact Sheet 2017–3088,* Retrieved from https://pubs.usgs.gov/fs/2017/3088/fs20173088.pdf

United States Energy Information Administration. (2012, January 20). Arctic oil and natural gas resources. Retrieved from https://www.eia.gov/todayinenergy/detail.php?id=4650

Vanderklippe, N. (2011, September 13). Oil drillers willing to accept liability for accidents in Arctic. *The Globe and Mail*, Retrieved from https://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/oil-drillers-willing-to-accept-liability-for-accidents-in-arctic/article4199962/

Verheij, A. (2007). Shifts in governance: Oil pollution. in M. Faure & (eds.), *Shifts in Compensation for Environmental Damage* (pp133-150) New York: Springer.

Vinogradov, S. (2013). The impact of the Deepwater Horizon: The evolving international legal regime for offshore accidental pollution prevention, preparedness, and response. *Ocean Development and International Law,* 44 (4), 337-362.

Vinogradov, S. V., & Wagner, J.P. (1998). International legal regime for the protection of the marine environment against operational pollution from offshore petroleum activities. in Z. Gao (Ed.), *Environmental regulation of oil and gas* (pp.93-141), London: Kluwer Law International.

Webb, T. (2010, November 12). Greenland wants $2bn bond from oil firms keen to drill in its Arctic waters. *The Guardian*, Retrieved from https://www.theguardian.com/business/2010/nov/12/greenland-oil-drilling-bond

Wilson Center. (2014). Opportunities and challenges for Arctic oil and gas development. *Eurasia Group Report for The Wilson Center, Washington, D.C.*, Retrieved from https://www.wilsoncenter.org/sites/default/files/Artic%20Report_F2.pdf

Zborowski, M. (2018, April 1). ExxonMobil exits Russian ventures, continues success off Guyana. Journal of Petroleum Technology, 70(4) Retrieved from https://www.spe.org/en/jpt/jpt-article-detail/?art=3945